

NOTES.

THE Queen held a Court at Windsor Castle on Thursday last, at which an address was presented by deputations from several bodies, among them being the Royal Society. The deputation from the Royal Society, consisting of Lord Lister (President), Sir John Evans (Treasurer), Prof. Michael Foster (Secretary), Prof. Arthur W. Rücker (Secretary), Prof. R. B. Clifton (Vice-President), Sir William Huggins, K.C.B. (Vice-President), Mr. W. T. Thiselton-Dyer, C.M.G. (Vice-President), Sir Joseph Dalton Hooker, G.C.S.I., C.B. (Past President), Lord Kelvin, G.C.V.O. (Past President), Sir George Gabriel Stokes, Bart. (Past President), with Mr. Robert W. F. Harrison (Assistant Secretary), was introduced to her Majesty's presence, when the President presented the address, to which the Queen made a gracious reply. The President, Treasurer, and Vice-President Prof. R. B. Clifton, had the honour of kissing her Majesty's hand.

THE Russian Admiral Makaroff, who is well known for his hydrological researches in the Northern Pacific on board the corvette *Vityaz*, has just left St. Petersburg for an Arctic trip. He will take this year the command of a flotilla of seven steamers, which are sent out by the Russian Government for the transport of coal and mixed cargo to the mouths of the Ob and the Yenisei, and for bringing back to Europe various cargo from Siberia. Three of these steamers have strongly-built stems, and will be used to break through the ice, in order to see if the short period of navigation across the Kara Sea cannot be prolonged in this way for a few days. Admiral Makaroff takes with him all the hydrological and meteorological instruments which he had on board the *Vityaz*, and he proposes to sail up the Yenisei in his flagship, and to return by the overland route.

THE fourth summer meeting of the American Mathematical Society will be held, under the Presidency of Prof. Simon Newcomb, at Toronto, on Monday and Tuesday, August 16 and 17. By invitation of the University of Toronto, the meeting will take place in the main building of the University. It has been decided to set apart one of the sessions for the general discussion of the following subjects: (1) The accurate definition of the subject-matter of modern mathematics. (2) The vocabulary of mathematics; the possibility of correcting and enriching it by co-operative action. Members of the British Association are invited to be present at the sessions.

THE nation owes much to the catholic taste and great liberality of Sir Augustus Wollaston Franks, late Keeper of British and Mediæval Antiquities in the British Museum. Archaeologists are given further cause for cherishing his memory by the announcement that he has bequeathed to the Museum all the collections lent by him to the Museum or to any other museum, with various other valuable collections and books, conditionally on the Government allowing a remission of probate duty with respect to them. This condition is thus expressed in the will: "And as to these bequests to the British Museum I desire my executors to apply to the Government for a remission of probate duty with respect to them. And if this be not granted I declare my said bequests to the Trustees of the British Museum to be null and void, and I desire and direct that the objects which would otherwise have passed to the British Museum be sold by public auction and the proceeds added to my general residuary estate." Sir Augustus Franks also bequeathed to the Society of Antiquaries of London, of which he was President, a number of rare and valuable books on antiquities, art, history, and genealogy, together with various heraldic manuscripts, drawings, and engravings of ancient seals.

THE Commission, under the direction of Prof. Koch, which investigated the origin of the plague in India, has issued its

report, and a few of the conclusions have been transmitted from Berlin through Reuter's agency. It appears that the plague bacillus, outside the human body or certain animals, has very brief vitality; and it does not develop in the absence of oxygen. Rats were proved to be in the highest degree susceptible, and to spread the plague germs and communicate them to human beings. For experiments with the object of producing immunity, apes were used, and it was ascertained that grey apes were as highly susceptible as rats, while brown apes were less so. Immunity was established after a lapse of between five and seven days. Apes thus treated possessed a high degree of immunity, and could endure a large quantity of plague culture, about two milligrammes. For the purposes of serum experiments Yersin serum was employed. Its protective power in the case of brown apes did not exceed eight days. Strong injections of serum proved to be of unquestionable curative efficacy. Haffkine's system of inoculation, which was applied to 1400 patients, is reported to have shown undoubted protective results, although a number of the patients were taken ill in consequence of the inoculation.

HERR ANDRÉE, with his two companions, Drs. Strindberg and Fraenkel, started from Danes Island, on July 11, on their balloon voyage to the North Pole. The weather was favourable, and there was a good breeze, which took the balloon in a north-north-east direction at the rate of about twenty miles an hour. From Danes Island to the North Pole is a distance of about six hundred miles, and the same distance has to be traversed on the other side of the Pole before known *terra firma* can be reached. The risks to which the explorers have exposed themselves are thus very great, for it is difficult to believe that the balloon will keep afloat long enough to permit the expedition to be safely terminated, though the capacity of the balloon was enlarged by 300 cubic metres from 4500 cubic metres before starting, and the silk was greatly strengthened by additional coats of varnish. Since the balloon started, southerly to south-westerly winds have prevailed over Spitsbergen, Norway, and the ice-regions. It is therefore assumed that the balloon went in the direction of Eastern Siberia.

THE Weights and Measures (Metric System) Bill came before the House of Lords on Tuesday. Lord Balfour, in moving the second reading of this Bill, pointed out that the circumstances in which it was proposed to Parliament by the Board of Trade were these. During the Session of 1895 a Select Committee of the other House was appointed to inquire whether any, and, if so, what, changes in the present system of weights and measures should be adopted. The Committee practically confined their attention to the consideration of the metric system, and they agreed to these three recommendations: (1) that the metric system of weights and measures be at once legalised for all purposes; (2) that after a lapse of two years the system be rendered compulsory by Act of Parliament; and (3) that the system be taught in all public elementary schools as a necessary and integral part of arithmetic. The last recommendation could, if thought expedient, be carried into effect without legislation. The Government were not prepared to adopt the second recommendation—that after two years the system be made compulsory. The Bill carried out the first of the recommendations of the Select Committee, and the evidence taken by the Select Committee clearly proved that there was a genuine demand among some of the large trades in some of the important commercial centres of the country for the legalisation of the system, and from the reports of some of our Consuls abroad it seemed to be of considerable importance that the system should be adopted, and to be shown that if adopted it would prove of material benefit to British trade. The Government did not intend to make the system compulsory, and the present Bill was confined

to simply legalising the system for those who required it without going further just now. After a few remarks by Lord Colchester, the second reading of the Bill was agreed to.

THE French Société d'Encouragement pour l'Industrie Nationale has awarded the following prizes :—The Giffard prize of one thousand francs to M. Ducos du Hauron, for his works on photography in colours; the grand gold medal, with Lavoisier's effigy, to M. F. Osmond, for his metallurgical researches; a prize of two thousand francs to M. Rousse for his production of chenille web; and five hundred francs to M. Livache, for his work entitled "Vernis et Huiles siccatives."

WE regret to announce the deaths of the following men of science :—Prof. D. Wilhelm Preyer, the well-known German physiologist; Dr. P. C. Plugge, professor of pharmacology and toxicology in the University of Gröningen, and author of a number of papers on physiological chemistry; Prof. Arminio Nobile, professor of geodesy in the University of Rome, and author of many valuable papers on astronomy; and Prof. Oertel, of Munich, distinguished for his researches on the etiology of diphtheria.

WE notice with regret the announcement of the death of Sir John Bucknill, F.R.S. For nine years he edited the *Journal of Mental Science*, and he was one of the original editors of *Brain*. He was the author of numerous psychological works, and wrote largely on insanity and allied subjects. In the Royal College of Physicians he filled the posts of Censor, Councillor, and Lumleian Lecturer. He was elected a Fellow of the Royal Society in 1866, and was knighted in July 1894, in recognition of his pioneer services in connection with the Volunteer movement.

THE death of Dr. Steenstrup, formerly professor of zoology at the University of Copenhagen, and director of the museum of that city, has already been announced. Dr. Steenstrup (says the *Zoologist*) was born in 1813, and had thus reached the eighty-fifth year of his life. He published much on natural history, but he will be principally remembered by his work on the subject of "Alternation of Generations." He also studied the prehistoric remains found in his own country, both as regards fauna and flora, and in 1866, in conjunction with Sir John Lubbock, contributed a memoir to the Ethnological Society of London "On the Flint Implements recently discovered at Persigny-le-Grand." He was a correspondant of the Section d'Anatomie et Zoologie of the Paris Academy of Sciences.

THE annual meeting of the German Botanical Society for 1897 will be held at Brunswick, commencing on September 21. The sixty-ninth meeting of the German Association of Naturalists and Physicians will be held at the same time. A special feature of the meeting will be an exhibition of scientific apparatus and appliances.

M. GAYON has been elected a member of the Section d'Économie rurale of the Paris Academy of Sciences, in succession to the late Prof. Hellriegel.

PRESIDENT JORDAN, of the Leland Stanford Junior University, has gone to Alaska, with the sanction of the United States Government, for the purpose of branding female seals in order to impair the value of their skins, and thus destroy the industry of pelagic sealing.

WE learn from *Malpighia* that Prof. Penzig, of Genoa, has returned from his botanical expedition to Java and Ceylon with very rich materials, which have been deposited in the Botanical Museum of the University of Genoa; and that Sig. F. Karo has undertaken a fresh exploration of Southern Siberia, as far as the river Amûr. His botanical collections will be examined and distributed by Dr. J. Freyn, of Prague.

THE detailed magnetic survey of the State of Maryland, begun last year, has been resumed, and is again under the charge of Dr. L. A. Bauer. Special stress will be laid this year upon the investigation of the marked local or regional disturbances in Central and North-eastern Maryland, revealed by last year's work. According to *Terrestrial Magnetism*, there are prospects that a neighbouring State will undertake a similar survey in the near future.

To find the relation between the small variations which distinguish individuals of the same group, and the large differences which separate species and genera, Mr. E. T. Brewster has examined the body measurements of eight races of men, and has determined the coefficient of variability of each dimension for each race (*Proc. Amer. Acad. Arts and Sciences*, vol. xxxii, pp. 269-80, May). His conclusion is "that there is so intimate a causal connection between the characters of individuals and those of the allied groups into which they are combined, that, in proportion as any character is variable in the individuals of one group, it is different in the allied groups."

AN exhibition of navigational instruments has been arranged by the Shipmasters' Society, and will be open from 10 a.m. to 6 p.m. at the Fishmongers' Hall, London Bridge, on August 4, 5 and 6. The promoters have endeavoured to trace the progress made in navigational instruments during the last sixty years. Admission will be free upon presentation of a visiting card. Catalogues will be ready just before the opening.

THE *Ceylon Observer* of June 18 urges the advisability of the appointment in Ceylon of a Government agricultural chemist, and the institution of agricultural experiments under his guidance. It is pointed out that Barbadoes and British Guiana, each with populations and revenue and export trade much smaller than those of Ceylon, have their Government chemists, and naturally those interested in agriculture in Ceylon feel aggrieved at not being placed on a footing similar to that of the people of the two dependencies mentioned.

THE Russian bacteriological stations, or "Pasteur Institutes," are displaying a considerable activity. We find, from the annual report of the Kazan station, that over 82,400 vaccinations against the "Siberian cattle plague" have been made during the past year, and that not only educated agriculturists but also the peasants begin to vaccinate their cattle. The Kazan bacteriologists make use exclusively of the bacterial vaccine of Profs. Lange and Cienkowski, which is prepared in the field laboratories, on the spot, the day before vaccination takes place. Demands for it come from the surrounding provinces, even from East Siberia. Researches into rabies and tuberculosis among cattle were carried on at the same time.

THE researches lately published about the supposed new element, "lucium," have induced Prof. Chroustchhoff to revise the work he had made in 1887 upon what he then supposed to be a new element, "russium," also obtained from the monazite sands of North Carolina. He gives a short report about his last investigations in the *Journal* of the Russian Chemical Society (xxix. 3). Having obtained during the last eight years about 25 kgr. of rare earths, he extracted from them 35 grammes of a substance which has all the properties of "russium." Its equivalent is equal to 70.5, and its spectrum is characterised by a group of green and violet lines. A detailed description of all the experiments will soon follow. Prof. Chroustchhoff also mentions that cerium, after it has been freed of all traces of thorium and other impurities, can be separated into several fractions differing from each other by their physical properties, and having, respectively, the atomic weights of 138, 140, 142, 146, and 156.5. It also seems that besides the two components of didymium, described by Auer, there exists a third component. The note contains a list of all the rare earths hitherto obtained, or supposed to exist.

THE article on "Styles of the Calendar," in a previous number of NATURE (No. 1443), has brought us several letters with special reference to the time of adoption of the "new style" by England and Scotland. One correspondent writes: "Scotland, like England, adhered to the Julian Calendar till 1752. What has caused the error . . . is the impression that the Act of the Scottish Parliament in 1599, 'for the year of God to begin the 1st of January yearly,' introduced the Gregorian Calendar into Scotland. But all that that statute did (as indeed its title indicates) was to enact that the year should begin in accordance with classical usage, on the 1st of January, and not, as was the mediæval custom, on the 25th of March." Another correspondent, besides endorsing the above, adds: "That what is meant by 'new style' is, of course, the adoption of the Gregorian reckoning; . . . this was done by England and Scotland together in September 1752, by dropping eleven in the numbering of the days. Accordingly, old style was in use in Scotland till 1752, and indeed is by no means wholly disused yet. . . ." The author of the above-mentioned article, Mr. W. T. Lynn, writes: "The alteration made by the Scotch in 1600 was restricted to the adoption of January 1 instead of March 25 as the first day of the legal year. This was effected in England in 1751 by the same Act of Parliament which provided that the Gregorian reckoning should henceforth be used in Great Britain. Perhaps I may point out the erroneous statement in the subject in the current (ninth) edition of the 'Encyclopædia Britannica,' where we read (vol. iv. p. 677): 'In Scotland the new style was adopted from the beginning of 1600, according to an Act of the Privy Council in December 1599.' The writer may have had in his mind what he was speaking of in the preceding sentence on the alteration in the commencement of the year (where, by the way, there is a slip or misprint of April 25 for March 25), but the expression 'new style' could not apply to that."

MR. A. T. DRUMMOND, writing from Kingston, Canada, says:—"In the course of an inquiry into the subject of old age pensions in Canada, I have had occasion to investigate, among other matters, the proportion which those who had in that country attained sixty years of age and upwards bore to the whole community. The result showed a constant increase in this proportion from 1851 onwards, as indicated by the following figures:—1851, 3.70 per cent.; 1861, 4.49 per cent.; 1871, 5.10 per cent.; 1881, 6.32 per cent.; 1891, 7.01 per cent. In the earlier years given, the proportion relative to their respective populations was always somewhat greater in the Province of Quebec than in the Province of Ontario; but in 1891 this was changed by those in Ontario reaching 7.16 per cent. Nova Scotia's proportion has always stood relatively high, and in 1891 was 8.91 per cent. Whilst emigration and immigration have each in turn tended to increase or diminish these proportions, and to qualify any conclusion which may be drawn, the general impression from these figures is that the population coming within the old age limit is increasing. This may be fairly considered as due to better food, improved sanitation in houses, the use of new methods and appliances in daily life which result in less wear on the system, and the more careful attention to rules of health which better education and greater prosperity have brought about."

EXPERIMENTAL farms similar to those supported by various continental Governments and in the United States have, unfortunately for British agriculture, not yet been established in this country. Researches in pots and plots are, however, carried out by a few societies and technical colleges having the interests of agriculture at heart, and the results are made accessible to farmers. The Glasgow and West of Scotland Technical College is one of the institutions which encourages work of this kind.

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A report now before us shows the results of manuring experiments conducted last year on farms in the south-west and centre of Scotland, under the direction of Prof. R. Patrick Wright. The report will, doubtless, prove as helpful to agriculturists as the official bulletins are to the farmers in America.

AN electrical method of determining the moisture content of arable soils is described by Messrs. M. Whitney, F. D. Gardner, and L. J. Briggs, in *Bulletin* No. 6 of the U.S. Department of Agriculture (Division of Soils). For a long time the importance of having a trustworthy and convenient method for determining the amount of moisture in soils has been recognised. It is pointed out that the rain does plants but little positive good until it enters the soil, where it can be absorbed by their roots. A record of the actual amount of water in the soil from day to day would, therefore, give the absolute value of the moisture conditions under which plants are growing, and even without reference to rainfall data it would show, if the character of the soil was understood, whether the conditions were favourable or otherwise for the crop. The difficulty has hitherto been to make this determination easily; for though various methods have been tried, very little success appears to have been achieved. The method described in the present bulletin seems, however, to be practicable and readily carried out. It consists in burying specially-constructed electrodes in the soil, so that by measuring the resistance to the passage of a current through the soil the amount of moisture in the soil can be determined. The possibility of using the electrical resistance of soils for the determination of moisture was suggested to the authors some years ago by the necessity of thoroughly grounding lightning rods, telephones, and telegraph lines. If these are not carried to a considerable depth, so that the terminals are constantly in a moist soil, the lines do not work in dry seasons. A fair number of observations have been made with the instruments described, and they appear to be satisfactory. The work was begun before the modern conceptions of the nature and principles of salt solutions and electrical conductivity had been developed, and it has been brought to a successful termination by regarding the soil as a difficultly soluble compound, and the soil moisture as a salt solution derived therefrom. The research is thus not only interesting from a practical point of view, but also from the standpoint of physical chemistry.

In the *Bollettino della Società Sismologica Italiana*, Signor G. Agamennone gives an account of the determination of the velocity of propagation of the earthquake shock which visited Amed (Asia Minor) on April 16, 1896. This investigation receives additional interest from the fact of the earthquake being the first occurring in the district, for the determination of whose velocity trustworthy data exist, the time of the Imperial Observatory of Constantinople affording an accurate means of timing the passage of the shock. Observations in Asia Minor itself gave a velocity of 1200 metres per second; but by comparing the observations with those made at Padua, a velocity of 3200 metres per second was obtained for the phase of reinforcement, and 2400 for the maximum disturbance.—In another part of the same journal, Signor Agamennone describes his photographic tromometer for registering seismic and other disturbances by means of a freely suspended heavy pendulum. In the present modification of the original apparatus, the components of the disturbance in two rectangular directions are separately registered.

WE learn from the *Annalen der Hydrographie und maritimen Meteorologie* for June that a new system of storm signals is to be established along the Dutch coasts. Nearly forty years ago the question of storm warnings was discussed by Prof. Buys Ballot at a meeting of scientific men at Bonn, and he subsequently adopted the method of cone and drum signals similar

to those introduced by Admiral FitzRoy in this country. But in the year 1866, when these signals were temporarily discontinued here, and shortly afterwards re-established in a slightly modified form, Buys Ballot adopted an apparatus called Aeroclinoscope, a kind of semaphore with mast and arm, by means of which the direction and magnitude of the barometric differences from the normal conditions between certain places were made known. The system to be adopted during the current year is similar to that used on the German coasts, viz. a ball, two cones and two black flags by day, and red lamps by night. They are to be established at thirty-nine stations; and with a view to making the system as useful as possible, additional telegraphic information is received at the central office in Utrecht twice or thrice daily from various countries, to supplement the observations made in Holland. Much credit is due to the Dutch Meteorological Institute for undertaking this expensive work, for the general benefit of navigators.

THE Central Meteorological Office of France has just published in its *Annales* a useful catalogue of all meteorological observations made in France from the earliest times down to the year 1850. The catalogue has been prepared at a great cost of time and labour by M. Angot, by means of personal visits and by circulars issued through the Ministry of Public Instruction, and contains particulars of observations made at 241 stations. If similar catalogues were published for all countries, they would greatly facilitate meteorological researches, especially those relating to periodical phenomena, which are often frustrated for the want of knowing where to find observations of long duration.

MR. R. THAXTER contributes to the *Memoirs* of the American Academy of Arts and Sciences a very interesting monograph of the *Laboulbeniaceæ*, an order of Ascomycetous Fungi which shows a remarkable analogy in structure to the highest family of Alga, the Florideæ. The *Laboulbeniaceæ* are all minute parasites on living insects, chiefly aquatic; the larger number are American; and for our knowledge of the family we are largely indebted to Mr. Thaxter. Of the twenty-eight genera described in the monograph, only nine have at present been found in the Old World. The main body of the fungus is usually quite simple in structure, is composed of several cells, and is attached to the chitinous integument of the insect, not penetrating its tissue in the form of a mycelium. The sexual organs of reproduction are antheridia and procarys, the latter being multicellular structures containing a carpogenic cell, and bearing a trichogyne resembling that of the Florideæ. After fertilisation the asci are developed from the carpogenic cell, enclosed in a perithecium which resembles in many respects the cystocarp of the Florideæ. The spermatozoids or pollinoids are very minute, often rod-shaped bodies, and attach themselves in large numbers to the trichogyne, though actual fusion has not been observed. The trichogyne varies much in complexity of structure. It is never in direct communication with the carpogenic cell; the fertilising process must be conveyed through one or through several cells before it reaches the carpogenic cell. The author believes that the nucleus of the spermatozoids must pass from cell to cell through the length of the trichogyne, before impregnating the female nucleus in the carpogenic cell, a phenomenon which he states to be without its parallel in either the animal or the vegetable kingdom.

A NEW edition (the fourth) of Mr. Marriott's "Hints to Meteorological Observers" has just been issued by Mr. E. Stanford.

THE first report of Mr. J. C. Willis, the Director of the Royal Botanic Gardens, Ceylon, and successor to the late Dr. Trimen, has just come to hand.

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THE Report for 1895 of the Botanical Exchange Club of the British Isles (just received and dated 1897), by Mr. W. H. Beeby, contains a number of notes on critical species, as well as a record of many fresh localities.

THE current number of the *British Medical Journal* contains a list of the papers to be read, and the discussions announced to take place, at the forthcoming meeting of the British Medical Association in Montreal.

THE tenth annual report of the Scientific Society of the University of North Wales, for the Session 1896-97, has reached us. It contains brief abstracts of the papers and addresses which were given during the Session.

THE McGill University, of Montreal, has just issued the announcement of its Faculty of Applied Science for the Session 1897-98. The pamphlet contains all the preliminary information likely to be of use to those who may be thinking of taking instruction in science at the University.

MESSRS. SONNENSCHNEIN AND CO. announce as in preparation "The Laws of Thought," by Mrs. Boole, who, since the death of her husband, has been engaged in translating the results of his researches into language intelligible to all familiar with the elements of arithmetic and geometry.

MESSRS. BLISS, SANDS, AND CO. will shortly commence the publication of a new scientific series, entitled "The Progressive Science Series," edited by Mr. Frank Beddard, F.R.S. The volumes will aim at pointing out the lines of future discovery, but they will also contain sufficient historical and expository matter to enable students and investigators to learn what has been done. The late Prof. Cope wrote a volume on "Vertebrate Palæontology" for the series, which will also include a volume by Dr. Geikie on "Earth Structure"; one by Dr. St. George Mivart on "The Groundwork of Science," and one by Prof. Bonney on "Volcanoes." Other volumes are in contemplation on heredity in relation to crime; theories of matter; and the relation between science and religion. The series when completed will comprise works on every branch of science, some half-dozen or more being published in each year at first.

AMONG the articles and other publications which have come under our notice within the past few days are:—"Heredity and Neurosis," by Dr. Geo. H. Savage (in *Brain*, Parts lxxvii. and lxxviii.). This (the presidential address to the Neurological Society of London for 1897) is a paper in which the relationships of the neuroses are compared, and the lineal descent of these disorders of mental function are traced. The article is thus a valuable contribution to the facts of evolution.—"The Structure of Cross-striated Muscle, and a suggestion as to the Nature of its Contraction," by W. M'Dougall, in the *Journal of Anatomy and Physiology* (July). The paper is illustrated with half-tone reproductions of more than fifty photo-micrographs of sections of muscles and fibres. The suggestion as to the cause of contraction is formulated as follows: "Contraction is the result of an increase in the volume of the fluid contents of the sarcomere, and relaxation is accompanied by a diminution in their volume."—A detailed report on the violent Laibach earthquake of April 14, 1895, illustrated by four plates and forty-two text-figures, is given by Dr. Franz E. Suess, in the *Jahrbuch d. k.k. geol. Reichsanstalt*, Vienna (vol. xlv.). The report extends over nearly five hundred pages of the *Jahrbuch*, An earthquake said to resemble in many points the disturbance which Dr. Suess discusses, is reported to have occurred at Laibach shortly before seven o'clock on the morning of Thursday last, July 15. Considerable damage appears to have been done.—A finely-coloured geological and topographical map of the northern part of the Lake of the Woods and adjacent country has been published by the Geological Survey of Canada.

A COMPARISON between the magnetisation and associated change of length of iron and steel (*Längenänderung und Magnetisirung von Eisen und Stahl*) is the subject discussed by Dr. Klingenberg in his "Inaugural Dissertation" at Rostock University. The magnetisation and elongation of various wires were measured simultaneously under varied conditions of field-strength, longitudinal loading, and mechanical jarring, and the general conclusion was arrived at that there exists a pronounced similarity between the two associated phenomena. In its details the investigation is, to a large extent, a repetition of the well-known experiments of Joule, Bidwell, Ewing and others; but the peculiar merit of Dr. Klingenberg's work lies in the coordination of the two classes of phenomena simultaneously studied. It is a careful discussion of a sound piece of experimental work. In his concluding sections the author touches upon the question of magnetic strain, which Dr. Jones has more elaborately worked out in a paper recently published in the *Philosophical Transactions*. An ingenious attempt is also made to coordinate the curiously contrasted magnetic phenomena in iron, nickel, and cobalt in terms of the shape and orientation of the molecular magnets, whose rotations are believed to be the most essential feature in these phenomena. On the assumption that the iron molecules are ellipsoids magnetised, some along the long axis, others along the short axis, the author shows how the former will have preponderating influence in weak fields, while the latter will tell more and more in strong fields. In nickel, the assumption is that the ellipsoids are almost exclusively magnetised along the short axis. On these assumptions the dilatation phenomena in iron and nickel, the Villari Reversal, &c., find ready enough explanation. The peculiarities of cobalt are stated to be explicable on the same lines.

If a fused solid substance be cooled below its melting point in a tube, and crystallisation then induced at one end, the rate at which this is propagated along the tube may be taken as a measure of the velocity of crystallisation. Gernez has found, with phosphorus and sulphur, that this velocity is proportional to the degree of super-cooling. Since, however, the surface at which the crystallisation actually takes place is always at the melting temperature of the substance, G. Tammann considers that the velocity ought to be independent of the degree of super-cooling, and in the current number of the *Zeitschrift für Physikalische Chemie* publishes the results of some experiments on the point. Using benzophenone, which was not quite pure, he finds that the rate of crystallisation increases with the super-cooling until the latter amounts to about 20° (or less with a purer sample). From this point the velocity remains constant until the super-cooling is so great that the heat evolved by the solidification is insufficient to heat the solid formed to the melting temperature. *The rate of crystallisation diminishes rapidly from this point onwards.* For example, at -40° a crystal of benzophenone introduced into the super-cooled substance changes so little that an observer might easily imagine that the liquid was at its melting temperature; on allowing the temperature to rise crystallisation begins, slowly at -35° , rapidly at -25° . Phosphorus, again, solidifies at least one hundred times more slowly at 0° than at 24° . These observations seem to provide a fresh point of resemblance between so-called physical and chemical changes, since, of the latter, it has long been known that even the most energetic proceed extremely slowly at sufficiently low temperatures.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, δ) from India, presented by Master Jan. B. Dickson; a Mozambique Monkey (*Cercopithecus pygerythrus*) from East Africa, presented by Mr. A. E. Snooks; a Bonnet Monkey (*Macacus sinicus*, δ) from India, presented by Mr. W. Meears; a Black Lemur

(*Lemur macao*), a Black-headed Lemur (*Lemur brunneus*), a Grey Lemur (*Haplemur griseus*) from Madagascar, presented by Mr. R. A. Todd; a Roseate Spoonbill (*Ajaia rosea*) from South America, presented by Mr. E. J. Ghay; a Common Peafowl (*Pavo cristatus*, δ) from India, presented by Mr. A. Burnell Tubbs; a Red-sided Eclectus (*Eclectus pectoralis*) from New Guinea, presented by Mr. Edward Hawkins; a — Cassowary (*Casuarius*, sp. ?) deposited; a Thar (*Capra jemlaica*), a Red Deer (*Cervus elaphus*, δ) born in the Gardens.

OUR ASTRONOMICAL COLUMN.

CAMBRIDGE OBSERVATORY REPORT.—Sir Robert Ball records the completion and publication of the zone 25° to 30° , which forms part of the "Catalog der Astronomischen Gesellschaft." In it are the places of 14,464 stars, the result of about 47,570 observations, the Observatory having been engaged in this work during the last quarter of a century. The complete catalogue containing the individual observations is very nearly ready for press, and will be printed as soon as the volume already in the printer's hands has been issued. Mr. Hinks has undertaken a detailed comparison of the places of 671 stars in the Cambridge and Berlin Catalogues lying in the zone $+24^{\circ}50'$ to $+25^{\circ}10'$. The result seems to have been very satisfactory, the differences of declination being very small and apparently accidental, while in the case of the right ascensions small but systematic differences depending on the magnitude of the stars have been found. The designs for the new photographic telescope have been completed, and the instrument is being pushed forward; it is mentioned that probably the new building to contain it will be erected during the course of the summer. With regard to the Newall telescope, Mr. H. F. Newall tells us in his report, which is attached, that he has met with great difficulties in bringing his spectroscope into successful working order. The discrepancies were, however, securely traced, and the necessary alterations made, with the result that the photographs now obtained are considered very satisfactory. Some of the results already obtained, with regard to the motion of some stars in the line of sight, are given by him in his report, from which we make the following extract:—

Star.	No. of plates.	No. of lines employed.	Velocity deduced:	Potsdam results.	
				Vogel.	Scheiner.
α Tauri ...	1	5	+49.2	+47.6	+49.4
α Orionis...	1	4	+10.6	+15.6	+18.8
α Can. Min. ...	2	5 (each)	$\left\{ \begin{array}{l} -3.5 \\ -4.9 \end{array} \right.$	-7.2	-10.5
β Geminorum	1	5	-0.7	+1.9	+0.4
γ Leonis ...	2	3 (each)	$\left\{ \begin{array}{l} -42.3 \\ -37.5 \end{array} \right.$	-36.5	-40.5
α Boötis ...	7	7 (each)	$\left\{ \begin{array}{l} -5.9 \\ -6.8 \end{array} \right.$	-7.0	-8.3

In the last star in this list Belopolsky obtained the value -5.7 , while Keeler's was slightly larger, namely -6.8 .

The term of five years for which Mr. Newall placed his services at the disposal of the University in connection with this instrument has now been completed, and our readers will be glad to hear that he has renewed his proposal for another similar period.

NEW VARIABLE IN COMA BERENICES.—In a communication to the current number of the *Astronomischen Nachrichten* (No. 3433), Mr. T. D. Anderson gives details of the variable star he has recently discovered. It seems that on May 29 of this year he observed a star in the constellation of Coma Berenices, in position R.A. = 12h. 23^m. 0m., Decl. $+32^{\circ}17' \pm 1'$ (1855^o). This star was not found mentioned in the B.D., but its magnitude was estimated as exactly the same as B.D. $+31^{\circ}2373$, namely 8.8. About ten days afterwards Mr. Anderson again observed the star, but could detect no change whatever in its brightness. Observing with his 24-inch refractor some four weeks later—on July 9 and 10—he was still unable to see the star, although B.D. $+32^{\circ}2248$ and 2253, which were both much brighter than it on May 29, were clearly visible. The magnitude of this new variable must have been lower than 9.5.